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Good day California Air Resources Board

Condensing Flue Gas Heat Recovery

The technology of "condensing flue gas heat recovery" is designed to recover the waste energy that would otherwise be lost up the chimneys of natural gas fired boilers and appliances. Most boilers are approx. 80% efficient, which means that almost 20% of the natural gas energy that is put into these appliances is lost up the chimney. That adds up to be a lot of wasted energy! By implementing this technology, the efficiency of these appliances can be increased by 10 to 15%.

How Does This Technology Work?

<http://www.sidelsystems.com/pictures/1.jpg>

The hot waste flue gas energy that is leaving the natural gas appliance is diverted into the base section of the flue gas condenser. As this waste energy travels through the heat exchanger section, the heat is transferred into water that is then used for process or domestic requirements. Leaving the top of the heat exchanger is cool flue gas, with a small percentage of moisture. Most of the water that is created when this energy is being recovered is collected via the base of the unit and piped away.

The equipment has no moving parts, requires little or no maintenance and is self cleaning on the flue gas side.

Where Can This Technology Be Used?

Large buildings and facilities use natural gas boilers to generate steam or hot water for their space heating requirements, and to heat domestic water. Most schools, universities, hospitals, prisons, public buildings and hotels use boilers for these requirements. The recovered energy from the flue gas condenser can be put into the building's heating system, it can be used to heat the domestic water for bathing, doing dishes, to do laundry, or even to heat the swimming pool. Radiant floor or wall heating (besides being one of the nicest forms of space heating) works very well with this technology. Very little electrical energy is needed (compared to forced air systems) with this method of space heating and it can also be used for building cooling.

There are also many boilers used in industry to heat process water or water used for plant washdown. The food and beverage, textile, commercial laundry, chemical, pharmaceutical and agriculture industries can all benefit when applying this technology. Not only will a lot less greenhouse gas be emitted because of the increased energy efficiency, a lot less natural gas will have to be purchased, increasing their profit margins.

Why Is This Technology Not Used More?

Natural gas is considered to be a relatively cheap and clean burning fuel and most industries were not concerned with being energy efficient so the cost of natural gas was just considered a part of the cost of doing business. Other than the State of California legislating companies to reduce their NOx levels, increasing the energy efficiency of this fuel source has yet to be realized at the Federal and State levels.

This technology has been available and used in North America for over 20 years.

If this technology were to be applied in all new building designs, there should be no reason for the boiler rooms to be operating at less than a 90% efficiency.

In major retrofits many argue that the cost of applying this technology would be too great. If a 10% increase in energy efficiency were to be factored in, and the increased cost of natural gas taken into consideration over the life of this retrofitted building (30 to 50 years), the energy savings and reduced greenhouse gas emissions should still make this technology viable.

How Much Greenhouse Gas Would Be Reduced?

Increasing the energy efficiency of these natural gas appliances by 10 to 15% will reduce not only NOx, but all levels of pollutants associated with natural gas combustion, by that amount.

How much natural gas is consumed in the State for space heating and to heat domestic and process water in these buildings and facilities and by industry? How many tons of pollution can be associated to these requirements?

It is up to the State of California and the Air Resources Board to determine if reducing this amount of air pollution is worthwhile considering.

Are There Additional Benefits?

When the energy has been recovered from these waste flue gases, condensation is created. The condensation amounts depend on a few variables, but can be as little as a few gallons to as much as hundreds of gallons per hour. This condensation can be collected, treated if necessary, and then used to irrigate the lawns and flower beds. Now this technology is not only being used to conserve natural gas but also to conserve water.

How much more efficient can we be with natural gas?

I would hope that California, being the leader in Energy Efficiency, would consider promoting this technology and introduce "natural gas energy efficiency" as another method of reducing greenhouse gas emissions.

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